

ROSS BRIDGE

Tasmania



Nomination for an
NATIONAL ENGINEERING LANDMARK
REVISITED

by
The Engineering Heritage Tasmania
Engineers Australia
July 2006

Includes the original nomination for a NEL in January 2002

1. INTRODUCTION

The original submission, dated January 2002, was for a National Engineering Landmark (NEL), as shown in the title page, which is a modified reproduction of the title page of that submission.

At the time the Committee decided to downgrade the award to Historic Engineering Marker (HEM). The reasons given for this were:

- The bridge is not particularly large, compared with e.g. the Lansdowne Bridge in NSW. Ross Bridge consists of three spans of 9 m.
- The carvings of voussoir arch stones cannot be considered part of the engineered structure, these being simply architectural embellishments.

The purpose of this submission is to request that this ruling be reconsidered and that the bridge be awarded a National Engineering Landmark. The arguments supporting this request are set out below, specifically addressing the above two reasons for a downgrade to (HEM).

2. STRUCTURAL DESIGN and CONSTRUCTION

2.1 Size and Location

The size of the bridge and its number of spans is of course dictated by the local geography of the river and its flood plain. John Lee Archer, being trained as an Architect as well as an Engineer, was guided in his design by what was appropriate to this particular location, consisting of a river flat surrounded by a slightly undulating landscape. He developed a bridge profile which would not seek to dominate the landscape, but form an organic and integral part of it. The number of spans was largely governed by the span/rise ratio of the arch, which he chose as four, at the time within the range of "sensible" ratios. Later in the 19th century, this ratio was increased to 7 - 9 under the influence of Perronet in France.

As explained in the original submission (refer Par. 3, Structural Form), John Lee Archer, being trained in classical architectural aesthetics, chose whole numbers for the major proportions of the bridge. This was in accordance with the rules of aesthetics originally established by Pythagoras in the 5th century BC.

The resulting structure is remarkably beautiful, it has been hailed as "the prettiest bridge in Australia". It is certainly testimony to Palladio's writing, quoted in the submission and repeated below:

"The pure proportions of tones are harmonies for the ear, the corresponding harmonies of spatial proportions are harmonies for the eye. Such harmonies give us the feeling of delight, but no-one knows why – except he who studies the causes of things"

2.2 Workmanship

The present condition of the bridge is testimonial to the superb workmanship employed in its construction. It was constructed by a convict workforce under the supervision of two fellow convicts, Daniel Herbert and James Colbeck, both stonemasons, the whole under the superintendence of Capt. William Turner.

The performance of this workforce, as regards both quality and efficiency, must be considered unique in the history of convict labour in Australia. It is a rare and fortuitous occurrence when a team of leaders consisting of members of such diverse backgrounds emerges to provide an example of superb trade skills and inspirational leadership.

Ross Bridge, as it stands today, 170 years after its festive opening, shows remarkably little wear and tear. Founded on a rock plate, its foundations have not moved. The joints in the stonework are of the highest order of accuracy and show no cracks to speak of.

In 1976/77 the roadway was reconstructed and provided with an under-floor elastomeric seal and drainage system.

3. STONE CARVINGS on ARCH STONES

3.1 *Origins*

The initiative to provide each of the arch stones with a deep relief carving originated with Daniel Herbert. It is most striking that, in amongst all the voluminous correspondence concerning this bridge, between the Lieutenant-Governor, the Colonial Architect/Engineer, the Superintendent of Convicts, the Inspector of Public Works, local settlers and the Superintendent of Ross, there is not any mention of these carvings. Herbert must have gained prior permission from Capt. Turner to sculpt these stones, and this permission must have been granted, at least verbally.

Capt. Turner did not officially inform anyone of his decision. John Lee Archer must have seen this work in progress during one of his site visits, yet his diary appears to be silent on the subject. The same applies to Roderick O'Connor, the Inspector of Works. There are 186 icons, one on each of the voussoirs forming the six arches. Sculpting these stones cannot have been done in secret. One may postulate that Capt. Turner, having given Herbert permission to do this work, led a conspiracy of silence, by explaining to all concerned that the carving of these stones was the convicts' contribution to the appearance of the bridge and was improving morale, and thus efficiency and standard of workmanship.

An extensive review of stone arch bridges in Italy (Roman arches), and the remainder of continental Europe and UK, especially France in the 17th and 18th century, has failed to identify similar carvings. The only decorations found occasionally were carvings of coats of arms on the key stones of central spans of stone arch bridges. The bridge at Ross must be considered unique in the world in this respect.

3.2 *Significance*

a) General

The carvings are generally Celtic symbolisms, the meaning of which has been lost, and was probably only known to their originator. They are interspersed with small icons of persons living at the time. Some of these may be seen as caricatures, although one cannot be at all certain of their intent. Some of the keystones have the clear symbolic meaning of depicting the evils of oppression.

b) Relative to the Bridge Structure

There is a general view, shared by the Ross community and the Government Department of Infrastructure, that these carvings form an integral part of the construction of this bridge.

They originated as a vision of a convict sculptor, who convinced his fellow convicts that the production of these sculptures somehow reaffirmed their humanity, be it at the cost of a considerable amount of hard work. Clearly, at the time the Superintendent, Capt. Turner, saw that his permission to produce them would assist in the creation of a purposeful and efficient team of construction workers that had the potential of producing a well-constructed bridge in a short time. In the event, this is what happened.

On this basis, the sculptures most certainly must be considered as an integral an important part of the bridge, and not a mere embellishment.

c) Restoration

In order to counter the severe weathering of the icons, digital scans have been taken of each icon. These will be compared with earlier photographs in order to build up the images to as close to their original appearance as possible. A computer driven machine will then be able to reproduce the scanned images. This is a long and expensive process. It is a measure of the length the Department is willing to go in order to preserve the carved images for posterity.

4. ASSESSMENT under ENGINEERS AUSTRALIA GUIDELINES

4.1 Levels of Awards

Quoting the Guidelines on this topic:

"Engineers Australia reserves its ultimate accolade, the National Engineering Landmark, for historic engineering works of outstanding heritage significance. Such items would ordinarily represent a milestone or a benchmark by which progress is measured"

4.2 Assessment

Elaborating on the assessment provided in the original nomination, the following paragraphs address in some detail the seven main criteria listed in the guidelines:

a) Historic Phase

The bridge was constructed in response to the urgent need to improve the crossing at the Macquarie River in the vital main road between Hobart and Launceston, the existing bridge having fallen into disrepair and being by its nature, a temporary solution (timber beams on dry-stone piers). The bridge is the result of a significant activity and a historical phase in the establishment and maintenance of road connections in early Tasmania.

b) Historic Individuals or Association

The building of this bridge is a significant historical event and is associated with its designer, John Lee Archer, the first Colonial Architect and Engineer in Tasmania, designer and builder of a number of outstanding buildings (Ordnance Store, Salamanca Place, Customs House, St. Johns Church Newtown, bridges in Hobart, lighthouses: Iron Pot and Cape Bruny).

c) Creative or Technical Achievement

Ross bridge is an outstanding example of the development of stone arch bridges as it was developed in France during the 19th century. The architectural design, the attention to detail, as well as the workmanship are of the very highest quality. As this was only the second arch bridge in Tasmania (the third in Australia), this achievement is truly remarkable. The architecture displays the designer's concern with the appropriate overall form to fit this location, together with the concern for classical aesthetic proportioning. It is an outstanding example of the art and science of arch bridge design and construction of the period.

d) Research Potential - Teaching and Understanding

The bridge is an important reference site regarding the design and execution of stone arch bridges as evolved in Europe from Roman times until the early 19th century. John Lee Archer's design proportions are more conservative than those of Peronnet's bridges, culminating in the Pont de la Concorde in 1796. However, the design parameters do take

account of the properties of the relatively soft sandstone of which the bridge is built, as well as of the architectural requirement for the bridge not to dominate the river flats of the Macquarie River.

The construction details of the bridge are exemplary in their design and execution. It is indeed a reference site for the study of these details.

e) Social or Cultural

The bridge is considered a major asset by the local community. It is being promoted by the community as a major tourist attraction and there is great pride in the presence of the carved voussoirs; photos and samples are displayed in the local wool museum. It may be concluded that the bridge is important to the community's sense of place.

The bridge is also an icon of Tasmanian tourism in that its photograph appears on many tourist brochures.

f) Rarity

The bridge design and construction details are unique as an example of the best techniques of stone arch bridge building in Australia at the time.

The carved voussoirs are unique in the world.

g) Representativeness

The bridge handsomely meets all the criteria listed under this heading in Appendix 'C' of the guidelines. It is outstanding because of its condition, setting and integrity, and because of the esteem in which it is held.

5. CONCLUSION

Originally, the Submission of Engineering Heritage Tasmania was to list the bridge as a National Engineering Landmark. At the time, the Plaquing Subcommittee of Engineering Heritage Australia downgraded this to award a Historic Engineering Marker.

In view of the above, it would appear that the downgrading to National Engineering Marker is not warranted. Therefore, it is recommended that the bridge at Ross be awarded the status of National Engineering Landmark.

POSTSCRIPT in March 2009:

In 2008 the National Trust (Tasmania) ran a competition to identify the 10 most important heritage icons, and Ross Bridge was one of those icons.

In February 2009, the EHA Plaquing Committee agreed to upgrade the award for the Ross Bridge from an Engineering Heritage Marker to a National Engineering Landmark. This is the first occasion in which an award has been upgraded.

ROSS BRIDGE

Tasmania



Submission for an

NATIONAL ENGINEERING LANDMARK

from

The Engineering Heritage Committee

Tasmania Division

The Institution of Engineers, Australia

January 2002

CONTENTS

	Page
1. Description of Ross Bridge	8
2. Short History	8
3. Structural Form	9
4. A Reflection	11
5. References	12
Nomination Form	13
Supporting Information	14
Statement of Engineering Heritage Significance	14
Approval of Owner	16
Appended Documents List.....	17
Maps	18, 19
Plates	20 to 25
Drawings	26 to 28
Register of the National Estate Database	29
Tasmanian Heritage Register.....	30

Cover photo: South face of Ross Bridge.

1. DESCRIPTION OF ROSS BRIDGE

The bridge, carrying the old Midland Highway across the Macquarie River at Ross, consists of three segmental arch spans, constructed from local sandstone. It was built by convict labour and completed in 1836.

Important features of this bridge are:

- the close attention to detail in its design and construction. The curved wing walls on all four corners contain staircases leading to the riverbanks. The overall proportions of the bridge appear to obey classical rules of aesthetics, giving rise to a pleasing appearance of strength and dependability. It admirably “fits” into the landscape without any attempt to dominate (Refer Plates No. 1 and 2),
- individual parapet blocks are meticulously tied with wrought iron dog clamps, carefully caulked with lead,
- all face blocks of the arches are richly and expertly carved, mainly using Celtic motifs and symbolism. While medieval stone arch bridges often exhibited coats-of-arms or other symbols on the keystones of their central spans, this is, to our knowledge, the only bridge in the world of which every tapered arch block (voussoir) has an intricately carved surface (Refer Plates No. 4, 5 and 6).

2. SHORT HISTORY

The original bridge across the Macquarie River at Ross consisted of drystone piers and logs, covered by a layer of road metal. This bridge was constructed in 1822 and formed a link in what is now the Midland Highway. An inspection in 1828 revealed that the two central piers had partly collapsed. Representations by local residents resulted in the Lieutenant Governor, Colonel George Arthur, instructing that Ross Bridge be repaired.

Following a number of inapt attempts at organising the repair work, using prisoners as labour, in 1831 one span of the bridge finally collapsed. This span was speedily repaired. By this time, the Inspector of Roads, Roderick O'Connor, developed the concept of a brick arch bridge, which would be considerably more durable than the existing timber log bridge. Accordingly, brick kilns were built and commenced producing bricks, causing a minor building boom in Ross, using the convict labour meant for the bridgework.

The Engineer Lee Archer arrived in November 1831, and suggested that the bridge be built out of sandstone available from a government quarry situated nearby and providing high quality stone.

During all this time, there was stationed at Ross a gang of convicts specially assigned to repair and maintain the bridge. This gang did obtain logs and stored them at the bridge site, as well as sandstone rocks from the quarry. However, failing any attempt to organise this gang, materials were pilfered by the local settlers and individual convicts went to work as labourers. Both the township and the surrounding countryside was being settled at the time, so both building materials and builder's labourers were in short supply.

Meanwhile a difference of opinion arose about the location of the new stone arch bridge between the Inspector of Roads and the Engineer. This was finally resolved in June 1832.

In April 1833 Lee Archer finished the design of the bridge by deleting two of the five arches, this being possible because of the shorter total span required in the location finally chosen. This location also has the advantage of providing a rock foundation for the piers. This feature

turned out to be very important for the ultimate durability of the bridge: locally, the Macquarie River is rather fast flowing and subject to flooding. Indeed, the piers of the old log bridge suffered from scour. At the time Lee Archer decided that there was no point in commencing work in the face of the approaching winter and ordered that preparation of material be continued.

Pilfering of materials and diversion of available labour went on unabated in spite of an official enquiry instituted by order of Lieutenant Governor Arthur. During this time the work suffered from lack of proper supervision and of craftsmen capable of selecting and setting natural stonework. The two foremost men available in the Colony were two convicts, James Colbeck and Daniel Herbert. They both gave their craft as “Stonemason”, although Herbert was, in fact, a sculptor. Eventually, both these men were assigned to Ross, to construct the bridge, under the Superintendent, Capt. William Turner, 50th Queens Own Regiment of Foot, Commandant of Ross, who took over on 1 June 1835.

Early in 1835 Lee Archer requested the Colonial Secretary that Colbeck and Herbert be given their emancipation on completion of the bridge. This request was approved.

Finally, a team that could successfully construct the bridge was in place:

- Lee Archer, a competent engineer/architect, having served dual apprenticeships, was a fine designer and to him we owe the aesthetically pleasing design and the fine engineering detail,
- Captain William Turner who, being an regular Infantry officer, probably knew little about bridge building, but a great deal about leadership of men after some 30 years of field experience,
- James Colbeck, a stone mason and a master in his craft,
- Daniel Herbert, a sculptor, with an extensive knowledge of Celtic symbolism and Greek mythology. Although little is known about his formative years in England, he must have enjoyed a good liberal education. It also appears that he had the gift of leading teams and for this bridge, he appears to have had a vision.

The bridge was completed on 14 June 1836 and opened by the Governor on 21 October of the same year.

An extensive restoration programme took place in 1975-'76, conducted by the Department of Main Roads, Tasmania. Sample Drawings covering this work, No. 3225-M1, M3 and M5 are enclosed.

In addition, a terrestrial photogrammetric survey using a Wild stereometric camera was conducted by the Specialist Services Group of the Surveying & Geographic Information Department of the Hydro-Electric Commission of Tasmania, in September 1992. This resulted in a most accurate elevation drawing of the bridge.

3. STRUCTURAL FORM

The bridge consists of three segmental arches. The dimensioning is classical (ref. 3, drg. No. 3255 M1):

- The three arches span 9 m each, and have a rise of 2.25 m or 1:4,
- The piers are 3 m wide each, a ratio on the span of 1:3,
- The height from obvert to top of balustrade is 2.25 m, a ratio of 1:1.

These simple proportions were already noted by Pythagoras of Samos (571-497 BC) as being pleasing to the ear, when applied to music, as well as to the eye when applied to architecture. This type of dimensioning is present in many ancient cathedrals.

These observations were re-affirmed on many occasions during the ensuing centuries. The theme recurs in the first major Roman treatise on architecture, “de Architectura”, the ten volume work by Marcus Vitruvius Pollio (84-18 BC). Andrea di Pietro da Padova (1508-1580), better known as Palladio, wrote: “The pure proportions of tones are harmonies for the ear, the corresponding harmonies of spatial proportions are harmonies for the eye. Such harmonies give us the feeling of delight, but no-one knows why – except he who studies the causes of things”.

A practical demonstration of this philosophy is given by Villard de Honnecourt, the 13th century cathedral builder, who illustrated harmonic canon for division based on the upper tone series $1 - 1/2 - 1/3 - 1/4$ etc. The following Villard diagram (Figure 1) was probably used for the design of Berne Cathedral.

Figure 1 – Villard diagram, showing
Cathedral tower proportions

The segmental arch was first developed in the 12th century by a monastic order of bridge building monks, the Fratres Pontifices. One of their first works in this style was the bridge across the Rhône at Avignon, completed in 1185.

The voussoirs in this type of construction need to be either tapered to form the arch, or made of very thin stone or brick, with tapering joints. The Ross Bridge is of the former type.

The piers are fairly wide by the standards that had been developed at the time (by Peronnet, in the 1780's) but are in harmony with the superstructure. They are equipped with substantial breakwaters both up- and down-stream, which give the pylons a streamline shape below the waterline (Refer Plate 2). The Macquarie River is flood-prone in this area, and subject to both large changes in river level and stream velocity. The pier heads are extended upward as shallow rectangular column protrusions to articulate the sequence of the three arches. There is a strong, continuous horizontal ledge, expressing the roadway level on the external walls. The parapets are solid stone with two courses of double-height blocks underneath the protruding balustrade. Together, these items express a strong unifying horizontal line.

4. A REFLECTION

In general, the design and construction of bridges has had, throughout history, a latent spiritual symbolism not present in the remaining built environment, with the notable exception of religious structures. This is expressed in one of the early titles of bishops, later reserved only for the Pope: Pontifex Maximus, the Supreme Bridgebuilder.

The Ross Bridge, with its extensively sculpted voussoirs, possesses this symbolism to a unique degree. There are other bridges with major sculpted decorations, but these are generally of a non-structural nature, like the statues of angels over the piers of the Ponte d'Angelo over the Tiber in Rome, or the Karlsbrücke over the Moldau in Prague with its thirty baroque statues of Saints and Bishops.

The sculpted decorations are unique in that they are largely Celtic (ie. pre-Christian) in origin. They represent neither established nobility in the form of coats-of-arms, nor Christianity in the form of sculptures of Saints. Such images as are included mostly represent ordinary people living in the Colony, but they are by no means the major theme of these arched, sculpted bands.

With the formation of an effective construction leadership team we see an immense upsurge of creative activity. Except for the gathering and stockpiling of materials, nothing happened between 1830 and 1835, these materials being the subject of a lively illicit trade with the local settlers. William Turner, Colbeck and Herbert arrived in June 1835 and the bridge was completed in July 1836. The contrast is stark.

We observe that quite suddenly a group of some twenty convicts, who the previous Christmas had caused a minor riot, settle down to do a significant construction project under the direction of two fellow convicts. It is obvious that William Turner created the environment in which this could happen, but it was Herbert who made it happen. Moreover, the meticulous workmanship and attention to detail speak of men who took pride in working well. Under the circumstances, this would call for inspired leadership.

There is no doubt, that Herbert saw the building of this bridge not as just another aspect of his punishment as a convict. He would have been well aware of the symbolism of the art of bridge building, just like the Fratres Pontifices were some 600 years earlier. His sculptures on the arches give evidence that for him, personally, this bridge had a symbolism of its own: the bridge from his servitude to his freedom.

5. REFERENCES

1. Greener, Leslie and Laird, Norman – *Ross Bridge and the Sculpture of Daniel Herbert*, Fullers Bookshop (publishing Division), Hobart
2. Leonhardt, Fritz – *Brücken, Ästhetik und Geschaltung – Bridges, Aesthetics And Design*, ISBN 3-421-02590-8, Deutsche Verlags-Anstalt, Stuttgart, 1984

Ross Bridge, Ross, Scale 1:50, Hydro-Electric Commision, Survey & Geographic

Commemorative Plaque Nomination Form

Date

To:

Commemorative Plaque Sub-Committee
The Institution of Engineers, Australia
Engineering House
11 National Circuit
BARTON ACT 2000

From...*Tasmania Division*
Nominating Body

The following work is nominated for a *National Engineering Landmark*

Name of work.....*ROSS BRIDGE*

Location, including address and map grid reference if a fixed work.....*In east-central
Tasmania, arch bridge across Macquarie River at Ross, Ref. 41.*

Owner *Department of Infrastructure, Energy & Resources*

The owner has been advised of the nomination of the work and has given approval:

Copy of letter attached

Access to site *by Midland Highway from Hobart or Launceston*

Future care and maintenance of the work.... *Department of Infrastructure, Energy &
Resources. Part of operational highway system*

Name of sponsor.....*Engineering Heritage Committee, Tasmania Division*

.....
Chairperson of Nominating Committee

.....
Chairperson of Division Heritage Committee

SUPPORTING INFORMATION

Name of work.....*ROSS BRIDGE*

Year of construction or manufacture.....*Completed in 1836*

Period of operation.....*Continuous since 1836*

Physical condition.....*Very good*

Engineering Heritage Significance:

Technological/scientific value *High*

Historical value.....*High*

Social value*High*

Landscape or townscape value *Very High*

Rarity.....*Unique*

Representativeness.....*Typical*

Contribution to the nation or region.....*Substantial*

Contribution to engineering *Considerable*

Persons associated with the work..... *Capt. William Turner, Commandant, Ross*

..... *John Lee Archer, Engineer*

..... *James Colbeck, Stonemason, Overseer*

..... *Daniel Herbert, " "*

Integrity *Sound*

Authenticity.....*Complete*

Comparable works (a) in Australia.....*Richmond Bridge, Landsdowne Bridge*

(b) Overseas*Medieval segmental arch bridges*

Statement of Engineering Heritage Significance

The Technological/scientific value of this bridge is rated high. It is a prime example of use of local materials and outstanding workmanship, using convict labour in the young Colony. The design by John Lee Archer, the Colony Architect/Engineer, is classical in concept and a good representation of this style current at the time.

The historical value is rated high. It is one of the oldest convict-built masonry arch bridges in Australia still in use.

The social value is rated high. At the time of construction the vital link formed in the Midland Highway between Hobart and Launceston by bridging the Macquarie River had all but disappeared. At present it forms the Southern access road to the important historical township of Ross.

The landscape and township value is rated very high. The bridge, with its classical proportions admirably fits into the rather flat landscape with the surrounding hills in the background, but without in any way dominating it. It forms a natural and fitting gateway into the township.

Rarity is rated as unique: there is no other bridge with such carved arch blocks that we know of.

Representativeness It is typical of the class of masonry segmental arch bridges, developed in Europe during the 12th century.

Contribution to the nation or region is rated substantial. It formed a vital and dependable connection between the two major cities in the Colony, Hobart and Launceston/Devonport.

Contribution to engineering is rated considerable. Both the design and the workmanship must rank among the best of their period.

Persons associated with the work. The team formed by the Commandant of Ross, Capt. William Turner, the Engineer of the Colony, John Lee Archer, and the two convict stonemasons, James Colbeck and Daniel Herbert, would be unique considering the period. Social divisions were rigid and convicts had no social status at all. Written evidence suggests that Turner and Herbert held each other in high regard. They formed, if not a friendship, then as close a friendly association as the circumstances would allow. Above all, this facet of the leadership of Turner would have been crucial to the ultimate success of the venture.

Integrity is rated sound. The bridge has for decades carried loads well above its design capacity without any signs of deterioration. It is destined to do so for many years to come.

Authenticity is marked complete. Engineering design, workmanship and the high-relief sculpted ornamentation are quite unique.

Significance is supported by the following registrations:

- Register of the National Estate - Citation No. 013164, dated 21/03/1978
- Tasmanian Heritage Council - Citation Ref. No. C4810

Copies of these are enclosed in the Appendix

Draft citation (70 words is optimum).....

ROSS BRIDGE

This bridge on the former Hobart to Launceston Road was designed by Engineer/Architect John Lee Archer. The bridge was constructed by two convict stonemasons, Daniel Herbert and James Colbeck, with a gang of convict labour, under the direction of Captain William Turner, Commandant of Ross. Herbert created the unique ornamentation on the arches. Both stonemasons were emancipated on completion of the bridge, which was officially opened by Lt. Governor Arthur on 21 October 1836.

LETTER OF APPROVAL FROM OWNER



DEPARTMENT of
INFRASTRUCTURE,
ENERGY and RESOURCES

ROADS & PUBLIC TRANSPORT

Enquiries: Brian Watson
Phone: 62332747
Fax: 62336657
Email: brian.watson@dier.tas.gov.au
Your Ref:
Our Ref: 005189

13th March 2002

Mr Keith Drewitt
Chairman, IEA Tas Division
Royal Engineers Building
2 Davey St
Hobart, Tas, 7000

Ross Bridge National Engineering Heritage Plaque Nomination

Dear Keith

Thank you for your letters requesting DIER's agreement to the proposal to apply for a National Engineering Heritage Plaque. The Department appreciates your interest in the heritage value of the Ross Bridge.

DIER has no objection to the placement of the plaque.

The location of the plaque on the bridge could possibly be on one of the curved end walls so that it will not interfere with pedestrians or create a hazard for vehicular traffic.

We would welcome your input in identifying the location for the plaque. Please contact Brian Watson so that these arrangements can be made.

Yours sincerely

Brian Watson

TECHNICAL OFFICER, ASSET MANAGEMENT STRATEGIES

Copies:

Geoff Mulcahy, Mike Williams

APPENDED DOCUMENTS

MAPS

Ross Location Map, SE Tasmania

Ross Bridge Location, Sheet 5234, Tasmania, 1:25 000 Series

PLATES

Plate 1 – Ross Bridge, General View, South Face

Plate 2 - General View, North Face

Plate 3 - North Face, Detail of East Arch

Plate 4 - North Face, Detail of Centre Span *)

Plate 5 - North Face, Detail of Celtic Symbols and
Image of Governor Arthur *)

Plate 6 - South Face, Image of Daniel Herbert with
Supporting Symbolism *)

*) **Note:** Plates 4, 5, and 6 taken from Ref 1

DRAWINGS

Department of Main Roads, Tasmania:

Drg No. 3225 M-1 Macquarie River Bridge, “Historic Ross Bridge”, Repairs to
Stonework

Department of Public works, Tasmania:

Drg No. 3225 M-3 Renovation to Downstream Northern Wingwall,

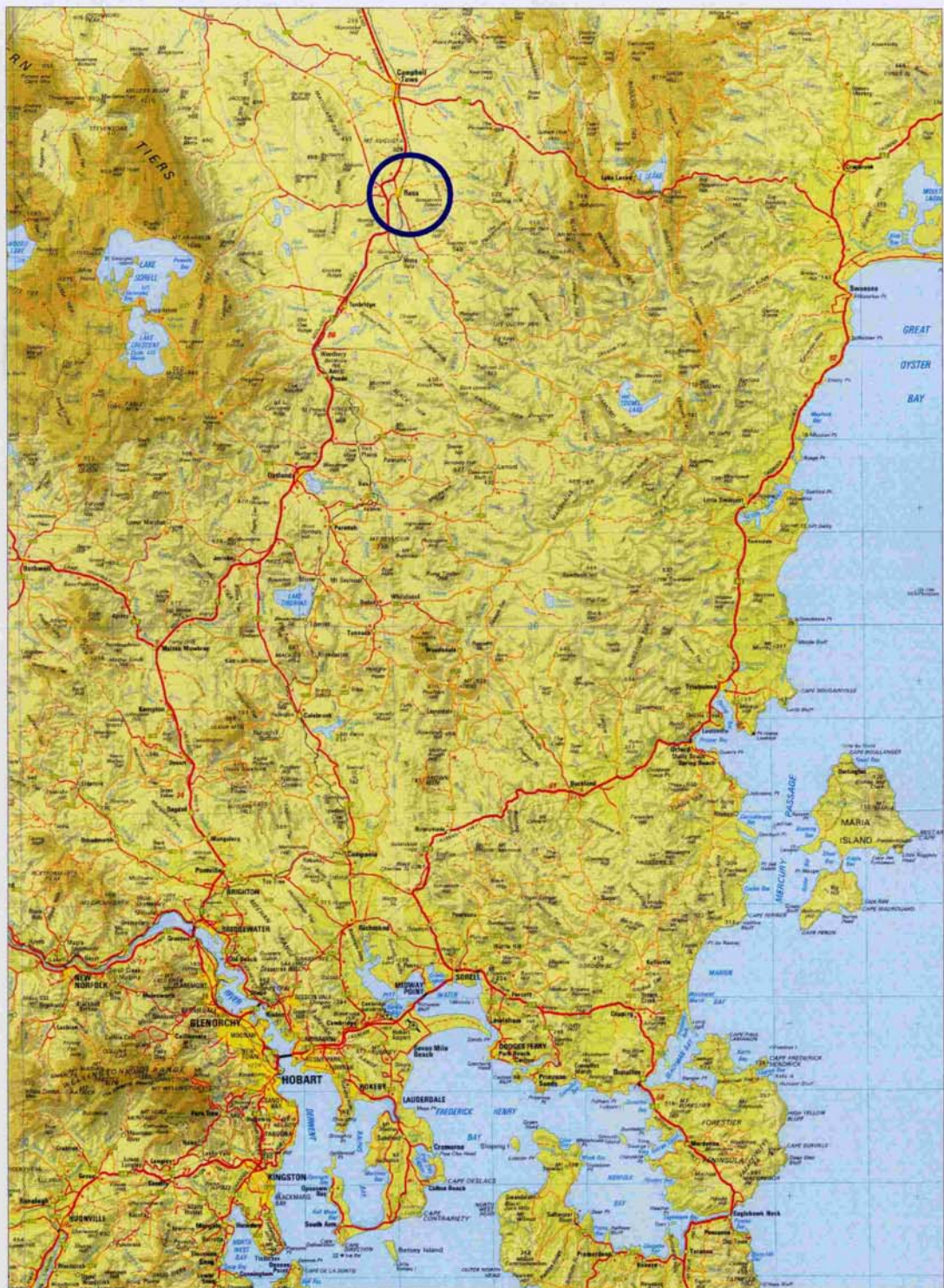
Drg No. 3225 M-5 Road Construction and Waterproofing of Bridge,

REGISTRATIONS

Register of the National Estate – Citation No. 013164, dated 21/03/1978

Tasmanian Heritage Council – Citation Ref. No. C4810

National Trust of Australia (Tasmania) – Bridge registered as “Classified”, citation as
per Register of the National Estate. Fax attached.



SHEET 5234 EDITION 1 1993 TASMANIA 1:25 000 SERIES

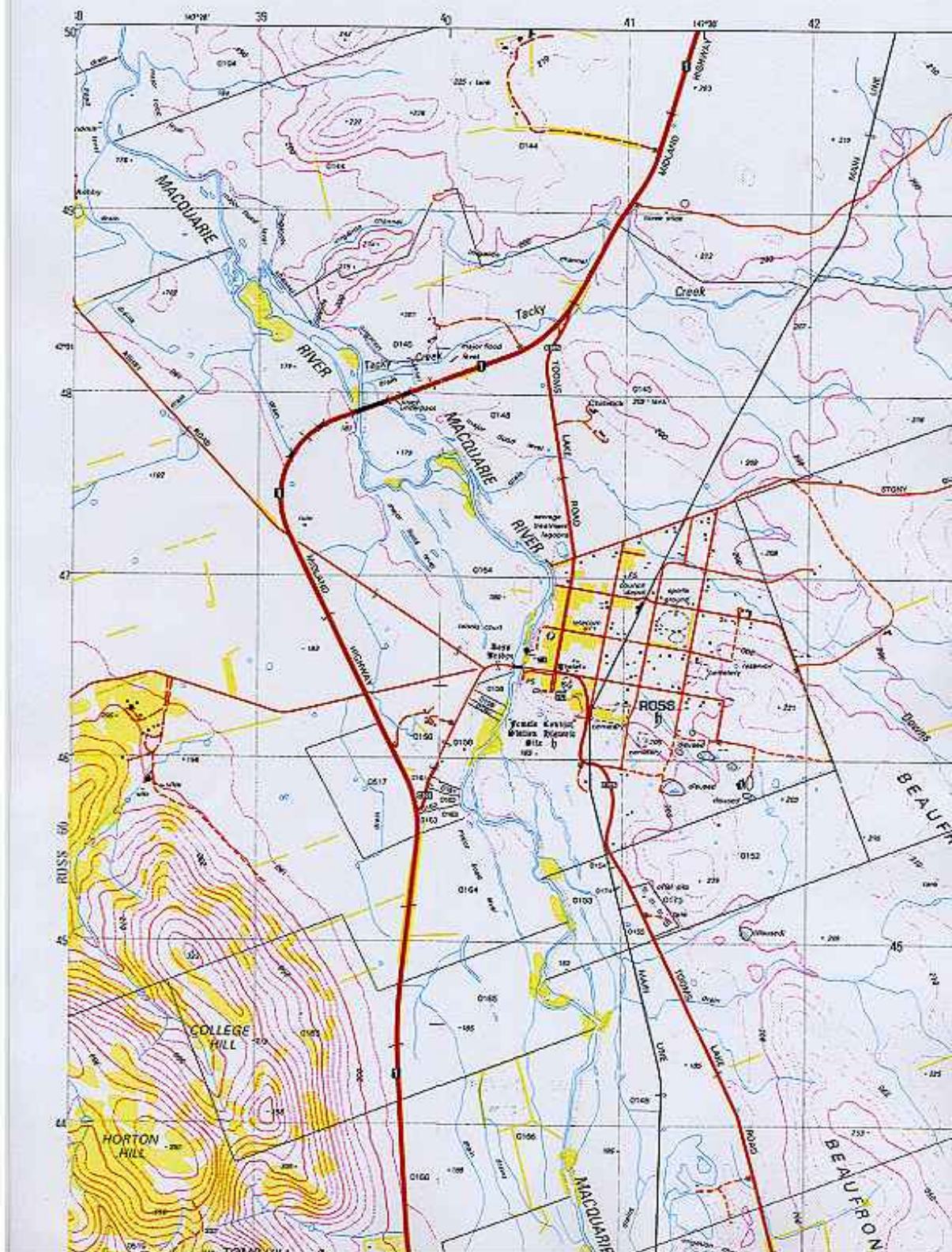




Plate 1 – Ross Bridge, General View, South Face



Plate 2 – Ross Bridge, General View, North Face



Plate 3 – Ross Bridge, North Face, Detail of East Arch

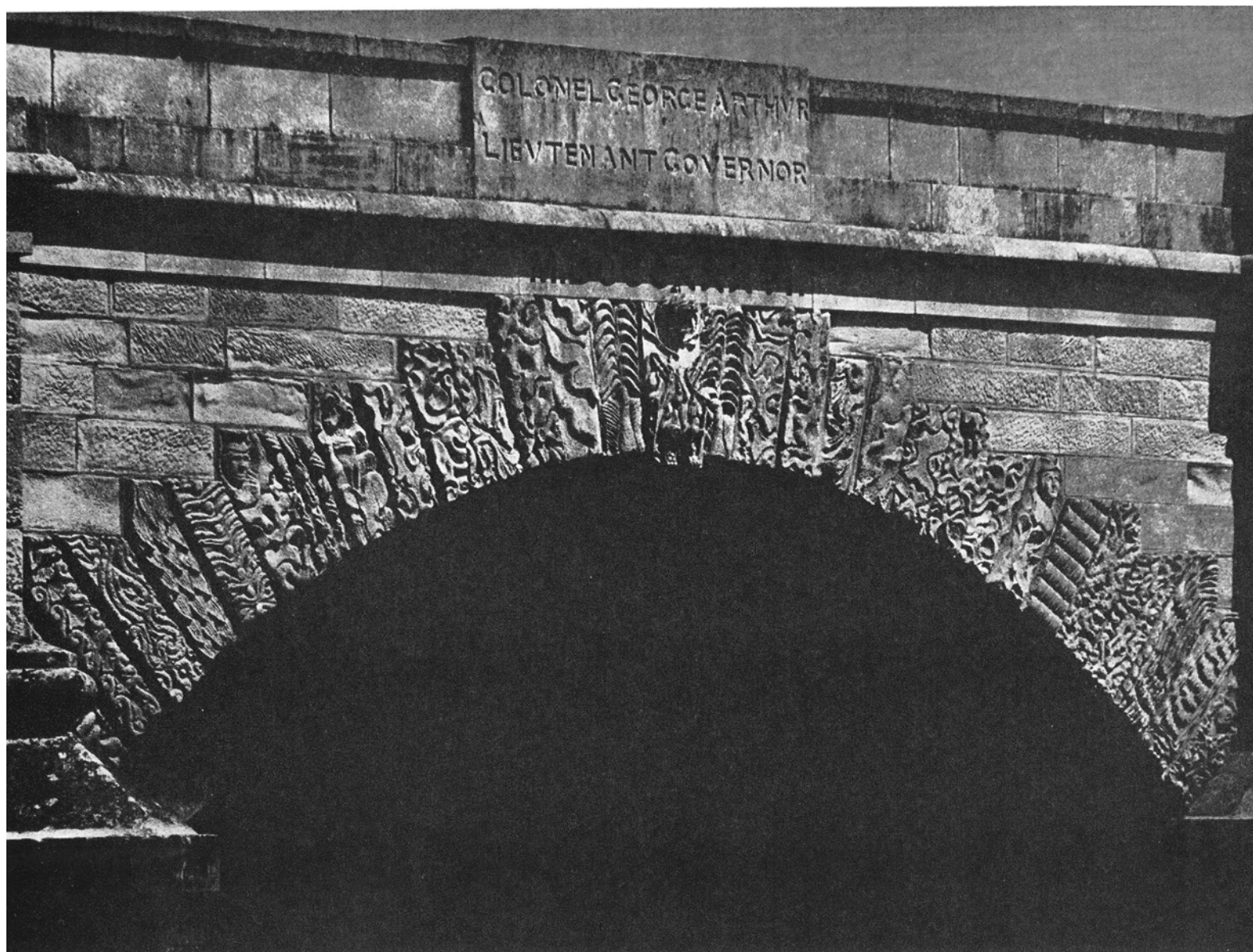


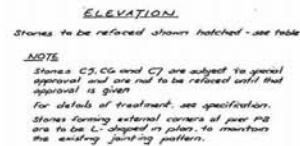
Plate 4 – Centre Arch, North Face



Plate 5 – North Face, Detail of Celtic Symbols and Image of Governor Arthur



Plate 6 – Ross Bridge, South Face, Image of Daniel Herbert with Supporting Symbolism

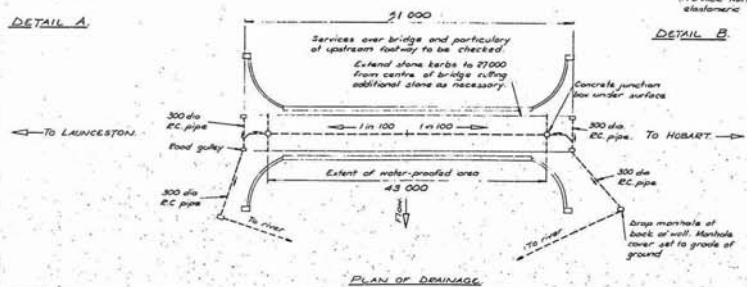


KEY TO NUMBERING SYSTEM

- N = Northern face
- W = Left hand wingwall
- P = First pier on left
- S = First span on left
- A, B, C etc = Courses
- 1, 2, 3 etc = Stones in diamond courses numbering from left.

Note:
During execution of work it was found that stones NW1/C7, NW1/E1 and NP2/O1 did not need to be replaced.

[illegible]



PLAN OF DRAINAGE.

EMULSIFICATION
ELASTOMERIC SHEET WATERPROOFING OF ROOF BRIDGE

- [illegible]

Application of Elastomeric sheet

The elastomeric sheet shall be unrolled directly on to the area to be covered, removing the protective covering as the sheet is laid. The sheets shall be laid longitudinally in a continuous strip. Joints will only be permitted between the edges of sheets and at the end of rolls.

The sheets shall be overlapped by a minimum of 50 mm with sheets shingled towards the low side. The sheets shall be kept taut during the laying process and the overlap shall be secured by a 25 mm wide strip of the same elastomeric sheet. Sheets laid adjacent to the parapets shall be returned up each parapet to the height as shown on the Drawing.

The overlap, both long-ways and across the sheet at end of rolls must be sealed with an approved solvent. The solvent shall be Toluene, xylene or approved equivalent and must be applied to both mating surfaces.

All edges of the plastic sheet (apart from sheet overlap) are to be sealed with "Efraseal" or approved equivalent, prior to placing the permanent.

If any air is found to be trapped under the sheets it shall be removed by puncturing the sheet, overlapping the edges of the puncture and pressing it firmly down on to the deck.

Portland cement dust shall be broadcast onto the sheets at the rate of one kilogram per 20 square metres after completion of laying and repair of any holes. This coating shall be such as to stop any tendency for the sheets to lift during rolling and any subsequent operations. Any excess cement shall be removed prior to rolling.

After the application of the sheets covering the elastomeric sheet shall be rolled by a pneumatic wheel roller or some other device. The pneumatic wheel roller shall have a minimum weight of 4 tonnes and a wheel pressure of at least 100 kN/m² with a minimum width of 600 mm. Rolling shall continue until the complete area of elastomeric sheet has been covered by the wheels of the roller. The wheels of the roller shall be kept clean of any foreign material and no water will be allowed on the wheels of the roller during this operation.

- (a) Wipe the arms of the elastomeric sheet to be patched with kerosene to remove cement dust.
- (b) Press sheet together over hole or place a piece of uncoated elastomeric sheet 50 mm larger than the

(c) Press the patch firmly down on to the area.

Laps between sheets shall be cleaned of portland cement dust by scrubbing with kerosene.

No traffic other than that necessary to place the elastomeric sheet or to place the finished surface shall be permitted on the elastomeric sheet after its installation.

The asphaltic concrete pavement shall be laped as required under the terms of the Contract Documents, except as specified herein. The course immediately on top of the elastomeric sheet shall have a maximum aggregate size of 5 mm, and shall be laid in the down-grade direction unless approved in be placed otherwise.

During composition of this course the edges of the paper run shall be pulled first than the central strip to reduce any tendency for sideways spread of the elastomeric sheet during rolling.

NOTES

1. For details of road profile refer to drawing prepared in the District Office.

2. No detail to be altered unless specially approved by Division Engineer (Bridges).

of all materials encountered with thickness measurements recorded, and all work, is to be documented amply with colour print photography by District staff.

4. Karb stones are to be carefully marked prior to removal so that they can be put back into the bridge in the same position. Refacing of kerbstones to be

5. The road fill material on the structure is to be of the highest quality so as to require minimum compaction.

No vibrating rollers are to be used.

Year	Number of cases	Number of deaths
1990	1,000	100
1991	1,200	120
1992	1,500	150
1993	1,800	180
1994	2,000	200
1995	2,200	220
1996	2,500	250
1997	2,800	280
1998	3,000	300
1999	3,200	320
2000	3,500	350
2001	3,800	380
2002	4,000	400
2003	4,200	420
2004	4,500	450
2005	4,800	480
2006	5,000	500
2007	5,200	520
2008	5,500	550
2009	5,800	580
2010	6,000	600
2011	6,200	620
2012	6,500	650
2013	6,800	680
2014	7,000	700
2015	7,200	720
2016	7,500	750
2017	7,800	780
2018	8,000	800
2019	8,200	820
2020	8,500	850

ending 9-1-76	Sub 110, 120 & 1250	DEPARTMENT OF PUBLIC WORKS - T
------------------	------------------------	--------------------------------

1	Bridge Inquiry	MACQUARIE RIVER BRIDGE
2	Location	ROAD RECONSTRUCTION AND
3	'HISTORIC ROSS BRIDGE'	

BRIDGE ROAD—ROSS	WATERPROOFING OF BRIDGE.
------------------	--------------------------

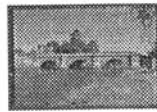
[illegible]



Register of the National Estate Database

[[RNE search](#) | [AHC Home](#) | [Disclaimer](#) | ©]

Ross Bridge, Ross TAS



Class: Historic

Legal Status: Registered (21/03/1978)

Database Number: 013164

File Number: 6/03/084/0009

Statement of Significance : Probably the finest masonry bridge of its period in Australia, the Ross Bridge was built in the period 1830-36 on the orders of Governor Arthur to a design by remarkable architect John Lee Archer. The unique features of the bridge are the fine carvings in high relief of animal forms, human heads and celtic icons by convict stone mason, Daniel Herbert. The bridge is the essential element of the historic town of Ross.

(The Commission is in the process of developing and/or upgrading official statements for places listed prior to 1991. The above data was mainly provided by the nominator and has not yet been revised by the Commission.)

Description : Colonial stone bridge. Three segmental arches spring from the splayed tops of supporting piers which project on both sides of the bridge and are shaped as cutwaters with weathered and moulded copings. Piers project through walls and parapet. Moulded string course and plain coursing mitred round piers. Fine carvings on all six faces of the arches, voussoirs and keystones. Stone bollards and chains to approaches.

Condition and Integrity : Major restoration just completed.

Location : Bridge Street, over the Macquarie River, Ross.

The Register of the National Estate has been compiled since 1976. The Commission is in the process of developing and/or upgrading official statements of significance for places listed prior to 1991.

Report produced : 11/4/2002

RNEDB URL : <http://www.ahc.gov.au/register/easydatabase/database.html>

[[RNE search](#) | [AHC Home](#) | [Disclaimer](#) | ©]

Tasmanian Heritage Council

134 Macquarie St or GPO Box 618 Hobart Tasmania 700

Name: **Ross Bridge**

Reference: **C4810**

Bridge Street

Ross

Northern Midlands

Original Use: *Transport, Land routes*

Present Use: *Transport, Land routes*

Feature Type: *Bridge*

Architectural Style: *Old Colonial Georgian*

Integrity: *Predominantly intact.*

Floors: *Roof:*

Walls: *Sandstone*

Attic: *Basement:*

Streetscape Contribution: *This structure is a significant element in the urban townscape.*

History: *Probably the finest and most picturesque masonry bridge of its period in Australia, the Ross Bridge was built in the period 1830-36 on the orders of Governor Arthur to a design by architect John Lee Archer. The unique features of the bridge are the fine carvings in high relief of animal forms, human heads and celtic icons by convict stone masons, Daniel Herbert and James Colbeck. The bridge is the essential element of the historic town of Ross*

Physical Description: *This is an Old Colonial sandstone bridge, with three segmental arches sprung from the splayed tops of supporting piers which project on both sides of the bridge and are shaped as cutwaters with weathered and moulded copings. Piers project through walls. There is a parapet, moulded string course, plain coursing mitred round piers, fine carvings on all six faces of the arches, voussoirs and keystones, and stone bollards and chains to the approaches.*



CRITERIA FOR ENTRY IN REGISTER (Refer to Section 16 of the HCH Act for the expanded criteria.)

(a)-Historical:

The bridge is of historic heritage significance because it is able to demonstrate the growth and development of transport and communication in colonial Tasmania.

(b)-Rarity:

Ross Bridge is of historic heritage significance as the only decorative carved stone bridge in Australia.

(c)-Research Potential:

(d)-Representative of:

(e)-Creative / Technical:

Ross Bridge is of historic heritage significance as an early sandstone bridge able to demonstrate a high degree of technical and creative achievement.

(f)-Community:

This building is of historic heritage significance because its townscape associations are regarded as important to the community's sense of place.

(g)-Association:

Ross Bridge is of historic heritage significance for its associations with John Lee Archer, Colonial Architect and Daniel Herbert and James Colbeck, convict masons.

PLEASE NOTE

This data sheet is intended to provide sufficient information and justification for listing the place on the heritage register. Under the legislation, only one of the criteria needs to be met. The data sheet is not intended to be a comprehensive inventory of the heritage values of the place, there may be other heritage values of interest to the Heritage Council not currently acknowledged.